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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/527,790

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Aiichirou Sasaki

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EXAMINER

SLOMSKI, REBECCA

ART UNIT

PAPER NUMBER

2877

MAIL DATE

DELIVERY MODE

04/13/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/527,790	Applicant(s) SASAKI ET AL.
	Examiner REBECCA C. SLOMSKI	Art Unit 2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on 03/03/10 has been entered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuru et al. JP Publication 2003-098205 in view of Buks U.S. Patent #6,496,013.

1. With respect to claim 1, Mitsuru et al. discloses a field detecting optical device comprising:

- A light source (Drawing 1, laser diode 21)
- An electro optic crystal which is applied with an electric field based on a signal under test in which a birefringent index changes according to the electric field and which changes a polarization state of light incident from said light source according to the birefringent index and emits the light (Drawing 1, electro optic element 23, P.0014)

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- A detector that detects an electrical signal according to the change of the polarization state of the light emitted from said electro optic crystal (Drawing 1, photodiodes 43a and 43b)
- A first electrode that is provided close to said electro optic crystal and that applies the electric field based on the signal under test to said electro optic crystal (Drawing 1, 1st electrode 27)
- A second electrode that is provided close to said electro optic crystal and thereby forming a pair with said first electrode (Drawing 1, 2nd electrode 25)
- An auxiliary electrode that is electrically connected to said second electrode and that forms a ground capacitor (Drawing 1, ground electrode 31)
- The first capacitance between said auxiliary electrode and ground and the second capacitance between said first electrode and second electrode being arranged in series (Drawing 1)

However, Mitsuru fails to specifically disclose the capacitance between said auxiliary electrode and a ground is larger than a capacitance between said first electrode and second electrode.

Buks discloses a device for testing circuit boards comprising:

- A capacitance between an auxiliary electrode and a ground is larger than a capacitance between said first electrode and second electrode (Col.1, l 43-54)

It would have been obvious to one of ordinary skill in the art at the time of the invention to make the capacitance to the ground much larger than the measuring capacitance since a smaller change

in the electric field would comparatively change the measuring capacitance to a greater degree, increasing the sensitivity. Additionally, one of ordinary skill in the art would know, from general knowledge of electronics, that the first capacitance between the auxiliary and ground must be larger in order to flush the charge from the capacitance between the first and second electrodes providing quicker more exact measurements of the electro-optic crystal polarization.

2. With respect to claim 4, Mitsuru discloses all of the limitations as applied to claim 1 above. In addition, Mitsuru discloses:

- Wherein a distance between said auxiliary electrode and second electrode is larger than a distance between said first electrode and second electrode (Drawing 1, distance between electrode 25 and electrode 31 is larger than distance between electrode 25 and electrode 27)

3. With respect to claim 5, Mitsuru et al. discloses a field detecting optical device comprising all of the limitations as applied to claim 1 above.

However, Mitsuru et al. fails to disclose a distance changing means for changing a distance between said auxiliary electrode and second electrode by moving said auxiliary electrode.

It would have been obvious to one of ordinary skill in the art at the time the invention was conceived to change the distance between the auxiliary electrode and second electrode by moving said auxiliary electrode since it has been held that making an old device movable without producing any new and unexpected results involves only routine skill in the art. In re Lindberg, 93 USPQ 23 (CCPA 1952). It would have been desirable to have a distance changing means for

moving the auxiliary electrode since being able to place the electrode at varied distances allows for the electric field sensor as a whole to change in size depending on the space available and to keep the electrodes a distance away from each other dependent upon the voltages being used to avoid electric field cross talk.

4. With respect to claim 7, Mitsuru et al. discloses a field detecting optical device comprising all of the limitations as applied to claim 1 above.

However, Mitsuru et al. fails to specifically disclose said auxiliary electrode is insulated from a circuit that constitutes said detector and a circuit that drives said light source.

It would have been obvious to one of ordinary skill in the art at the time the invention was conceived to insulate the auxiliary electrode from the circuits since this is well known in the art and necessary in order to protect the circuit elements from the ground voltage charges of the electrode.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuru et al. JP Publication 2003-098205 in view of Buks et al. U.S. Patent #6,496,013 and further in view of Brown U.S. Patent #5,789,846.

5. With respect to claims 2 and 3, Mitsuru et al. discloses a field detecting optical device comprising all of the limitations as applied to claim 1 above. However, Mitsuru et al. fails to specifically disclose the surface area of the auxiliary electrode is larger than the surface area of the first electrode and the second electrode, as well as the auxiliary electrode is in the shape of a bar, tubular or spherical.

Brown discloses a capacitively coupled ground electrode comprising:

- A first and second electrode (Figure 1, signal electrode and secondary ground electrode S and G')
- An auxiliary electrode that is electrically connected to said second electrode and forms a ground capacitor (Figure 1, primary ground electrode G)
- A surface area of said auxiliary electrode is larger than each surface area of said first electrode and second electrode (Figure 1, primary ground G is larger than S and G')
- A shape of said auxiliary electrode is a bar shape (Figure 1, primary ground G)

It would have been obvious to one of ordinary skill in the art at the time the invention was conceived to include an auxiliary electrode (ground electrode) that is larger than a first and second electrode (signal electrode) since increasing the surface area of the ground electrode in relation to the surface area of the signal electrode increases the capacitance, reducing the impedance, making the connections more cost effective by reducing loss.

Additionally, it would have been obvious to have a capacitance formed between the ground electrode and the ground rather than grounding by direct contact since it is well known in the art that there is less error from a direct current path being created as evidenced by "Lessons in Electrical Circuits" Page 24.

Allowable Subject Matter

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. With respect to the argument that the capacitances of Buks are in a parallel configuration rather than in series, and therefore the claim limitations are not fully disclosed, the examiner disagrees. Initially, the examiner would like to point out that Mitsuru is the primary reference for these claims, and Buks was only depended upon to provide motivation for creating a greater capacitance with the ground than between the first and second electrodes. Mitsuru discloses the newly added limitation that the first and second capacitance are arranged in series as illustrated in drawings 1 and 2 and noted above. The disclosure of Buks indicates that by making the measurement capacitance small in comparison to the entire capacitance of the system, since it would require a lesser manipulation of the electric field, respectively for a noticeable change in measurements. Additionally, it is basic electronic knowledge that a capacitance with the ground acts as a charge flush on the system whether in series or parallel. By providing a larger capacitance at this location, the charge present in the electro-optic crystal will be flushed more quickly. This would be necessary for quick measurements since it would allow the electric field applied to the crystal to change faster, closer to instantaneous, without waiting for a delay from the previous charges to disperse.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to REBECCA C. SLOMSKI whose telephone number is (571)272-9787. The examiner can normally be reached on Monday through Thursday, 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory J. Toatley, Jr./
Supervisory Patent Examiner,
Art Unit 2877
12 April 2010

Rebecca C Slomski
Patent Examiner

rCS